

Chapter 17

Land Use and Planning

17.1 Affected Environment

This chapter describes the affected environment related to land uses and planning for the dam and reservoir modifications proposed under the SLWRI.

Because of the potential influence of the proposed modification of Shasta Dam and water deliveries over a large geographic area, the SLWRI includes both a primary study area and an extended study area. The primary study area has been further divided into Shasta Lake and vicinity and the upper Sacramento River (Shasta Dam to Red Bluff). The extended study area has been further divided into the lower Sacramento River and Delta and the CVP/SWP service areas.

The setting for land uses and planning in the Shasta Lake and vicinity portion of the primary study area consists of the portion of Shasta County north of Shasta Dam. This area encompasses Shasta Lake, lands surrounding the lake, and parts of the Pit River, Squaw Creek, McCloud River, and Sacramento River watersheds. Land use and planning in this area are influenced by land ownership, the presence of rural lakeside communities, and topography.

The setting for land uses and planning in the upper Sacramento River portion of the primary study area consists of the portion of Shasta County south of Shasta Dam and Tehama County. The incorporated cities of Shasta Lake, Redding, Anderson, and Red Bluff, all located along the Interstate 5 (I-5) corridor, establish urban settings in the otherwise rural upper Sacramento Valley. The upper Sacramento Valley is characterized by rolling hills with mountains to the north, east, and west. Land use and planning in this area are influenced by land ownership, historic land use patterns, topography, and population densities.

The land use and planning setting for the extended study area consists of 24 counties downstream from the Red Bluff Diversion Dam and encompasses all areas served by the CVP and the SWP. Land use and planning in the extended study area are influenced by the same factors identified for the upper Sacramento River study area. The type and focus of land use and planning may vary, however, in the large urban areas located in the extended study area.

17.1.1 Land Use

Shasta Lake and Vicinity

Land uses in the Shasta Lake and vicinity portion of the primary study area consist primarily of open space and other land uses that support recreational

activities in the Shasta Unit of the Whiskeytown-Shasta-Trinity National Recreation Area (NRA). The USFS manages the Shasta Unit of the NRA. Federally owned lands in the NRA total 235,740 acres, including Shasta Lake; lands held in private ownership total 10,347 acres. A small area around Shasta Dam is administered by Reclamation. In addition, the California Department of Transportation manages the I-5 corridor, and the Union Pacific Railroad (UPRR) manages the rail corridor that crosses the primary study area (Figure 17-1).

The following land use designations are applied to lands managed by the Shasta Unit of the NRA. Riparian Reserves, the largest land use designation in the NRA, are located in areas along rivers, streams, lakes, and wetlands, including the area inundated by Shasta Lake. Riparian Reserves were established to provide natural corridors throughout the NRA. Approximately 25 percent of the land in the NRA is designated Matrix and Adaptive Management; these areas generally emphasize recreation and visual quality. Late Successional Reserves (LSR) and Administratively Withdrawn Areas each account for 20 percent of the land use designations in the NRA. LSRs are characterized by large blocks of land reserved for northern spotted owl and other species that are dependent on late successional old-growth forest. Lands with this designation are scattered throughout the NRA; these lands have a natural appearance, with much of the land area covered with late successional forest vegetation.

The Shasta Unit of the NRA is not managed for timber harvest. Vegetation removal is permitted for fuel breaks, hazard tree removal, protection of life and property, prevention of significant losses caused by insects or disease, and wildlife habitat management.

Recreational and commercial land uses occupy 2 percent of the land managed by the Shasta-Trinity National Forest (STNF) within the Shasta Unit of the NRA. Recreational use in the NRA exceeds 2 million visitor days annually. Water-oriented activities, such as boating, fishing, waterskiing, and house-boating, are the main attractions. Marinas that currently operate on Shasta Lake include Antlers, Sugarloaf, Shasta, Lakeview, Holiday Harbor, Packers Bay, Bridge Bay, Silverthorn, Jones Valley, and Digger Bay. Other recreational land uses include hiking, camping, picnicking, and off-highway vehicle activities. A planning permit has been issued by the STNF to decommission Digger Bay and construct a new marina at Turntable Bay, but the permit was not exercised and has since been revoked.

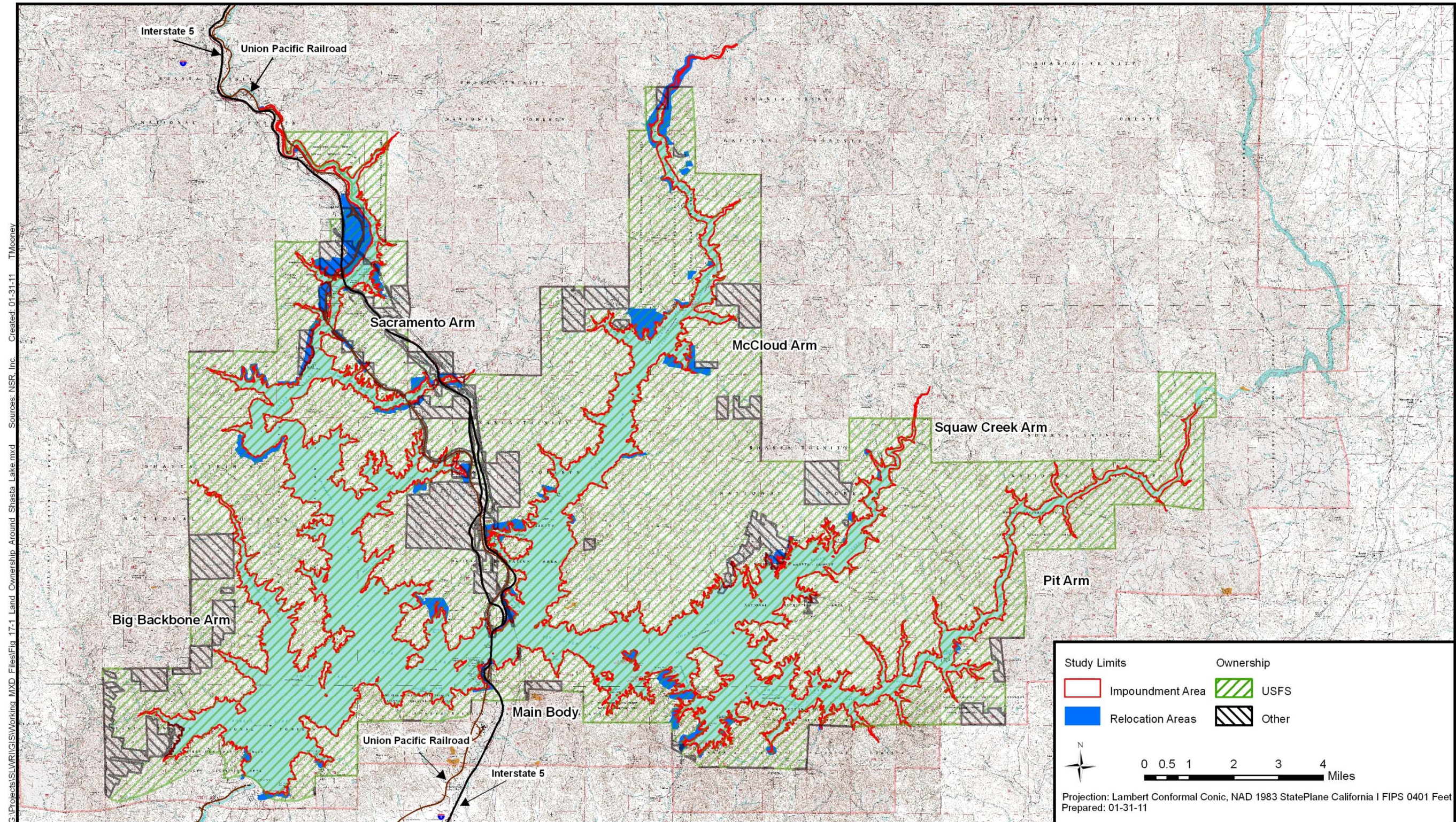


Figure 17-1. Land Ownership Around Shasta Lake

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Commercial land uses in the NRA include resorts, marinas, campgrounds, restaurants, motels, grocery stores, and service stations. Resorts typically operate in conjunction with marinas and include Sugarloaf Resort, Lakeview Resort, Bridge Bay Resort, Jones Valley Resort, Shasta Marina Resort, Silverthorn Resort, and Antlers Resort and Marina. Some resorts on Shasta Lake must move their docks substantial distances from their land-based facilities during periods of low water levels.

The USFS operates recreation residential tracts at Salt Creek, Silverthorn, Campbell Creek, and Didallas Creek; these tracts combined contain 160 privately owned cabins on National Forest System lands. USFS policy is to manage these tracts and residences for individual recreational use and to keep the areas as close as possible to their natural state. Only minimal improvements are permitted, and structures must blend into the natural environment.

Mining and grazing do not take place in the NRA. There are no grazing permits authorized for the Shasta Unit of the NRA, primarily because of a lack of suitable range. Federal lands in the NRA, except those with valid existing rights, were withdrawn from mineral entry by the legislation that created the NRA. Reclamation and USFS conducted validity determinations on most of the claims existing at that time and contested the majority of them based on the absence of a valid discovery. There are five claims in the NRA that predate the withdrawal. The lands covered by these claims remain open to mineral leasing, but there are no approved operating plans for these claims. Hard rock minerals in the NRA are available for prospecting, exploration, and development under solid mineral leasing regulations (36 Code of Federal Regulations (CFR) Subpart 3583). Authorization for this land use requires permits and leases subject to USFS terms and conditions to protect the values of the NRA.

Land uses on privately owned lands in the NRA generally consist of commercial, recreational, and residential land uses associated with the NRA. Approximately 20 percent of the privately held lands in the NRA are developed. Commercial development consists primarily of service industries supporting residents and recreational visitors.

Residential land uses are typically characterized as low density and rural. Established small communities along Shasta Lake include Lamoine, Lakehead, Lakeshore, and Sugarloaf, which are located on the Sacramento Arm of Shasta Lake. Farther south is the residential community of O'Brien, which is located between the Sacramento and McCloud arms near I-5.

The McCloud River, a portion of which is located in the Shasta Lake and vicinity portion of the primary study area, is eligible for listing as Wild and Scenic under the Federal Wild and Scenic Rivers Act (WSRA). In addition, although it is not state-listed as Wild and Scenic, the McCloud River receives certain protections under the California Public Resources Code (PRC), Section 5093.542, established through enactment of the California Wild and Scenic

Rivers Act, as amended (Sections 5093.50 – 5093.70). The effects of the proposed enlargement of Shasta Lake on the McCloud River are discussed in Chapter 25 of this EIS.

Upper Sacramento River (Shasta Dam to Red Bluff)

Land uses in the upper Sacramento River area consist of urban, residential, municipal and industrial, and agricultural uses. Urban development is located in the valley and is concentrated along the transportation corridors provided by I-5, State Route 273, and the UPRR. Incorporated cities located in the valley along I-5 in the upper Sacramento River study area are the cities of Shasta Lake, Redding, Anderson, and Red Bluff. Cottonwood, an unincorporated community located along the I-5 corridor, also has residential and commercial development.

Small rural communities characterize development patterns 5 to 8 miles east and west of the I-5 corridor. Many of these communities have their origins in the early settlement of Shasta County and Tehama County, as evidenced by the agriculture, grazing, and timber operations typical of the upland areas. These communities usually consist of small community centers surrounded by vast tracts of fields and forest that are dotted with home sites (Shasta County 2004).

The northern, western, and eastern portions of Shasta County are relatively uninhabited because the lands in these areas are managed by USFS for timber, wildlife, and wilderness uses. Lands managed by USFS in the western and southeastern portions of Tehama County are also relatively uninhabited.

The National Park Service manages lands in the upper Sacramento River study area, including the Whiskeytown Unit of the NRA, west of Keswick, and Lassen Volcanic National Park, in the northeastern corner of Tehama County. The U.S. Bureau of Land Management (BLM) manages the 12,194-acre Sacramento River Bend Management Area on the east side of the Sacramento River northeast of Red Bluff.

Lower Sacramento River and Delta

Land uses in the extended study area vary greatly because of differences in population, economy, and environment. Land uses in the Sacramento River valley are principally agricultural and open space, with urban development focused around the state capital in the Sacramento metropolitan area. The primary private land use in the region is agriculture. As of 1997, the Sacramento Valley area contained more than 11,000 farms on about 4.3 million acres. Urban development has occurred along major highway corridors, primarily in Sacramento, Placer, El Dorado, Yolo, Solano, and Sutter counties, and has caused some agricultural land to be taken out of production. For those lands that remain agricultural, soil conditions allow a wide variation in crop mix.

The American River is in the lower Sacramento River and Delta portion of the extended study area. Two sections of the American River, the North Fork American River from its source in the Sierra Nevada to the Iowa Hill Bridge

near Colfax, and the lower American River from Nimbus Dam to the river's confluence with the Sacramento River in the city of Sacramento, are listed as Wild and Scenic under the Federal WSRA and State PRC.

The listed segment of the North Fork American River is designated as a wild river under the Federal WSRA and State PRC. The listed segment is above any regulated reaches and is not under the control of the Central Valley Project or the State Water Project. The downstream end of the listed segment is more than 70 river miles and 50 air miles upstream from the confluence with the Sacramento River and is thus too far away to be affected by any hydraulic changes in the Sacramento River.

The lower American River is regulated by Folsom Dam, which is approximately 7 miles upstream from Nimbus Dam. Both Shasta Dam and Folsom Dam release water in accordance with their operational requirements, including releases to maintain water quality for fisheries, municipal use, and agricultural use, and for exports to the San Joaquin Valley. Both dams have operational requirements for the sections of the Sacramento and lower American rivers above their confluence, and they also have shared operational requirements for the Sacramento River and Delta below the confluence. Therefore, operational changes at one dam could require operational changes at the other. For example, reduced releases from Shasta Dam could require increased releases from Folsom Dam to meet flow requirements in the lower Sacramento River and Delta.

The lower American River is designated as a recreational river under the Federal WSRA and State PRC. Fishing and boating, including rafting and canoeing, are the primary recreational activities on the river. In addition, much of the lower American River's south shore is part of the American River Parkway. Joggers, bicyclists, walkers, and families use the riverside trails and beaches of this extensive park system.

CVP/SWP Service Areas

The CVP, operated by Reclamation, is the largest water storage and delivery system in California, covering 29 of the state's 58 counties. Most of the CVP service area is in the Central Valley, and about 90 percent of the south-of-Delta contractual delivery is for agricultural uses (Reclamation 2007).

Most of the population of the CVP service area is concentrated within urban areas. The CVP service area includes various municipal and industrial water contractors and water districts that serve portions of the Sacramento and Stockton metropolitan areas and the San Francisco Bay Area. Outside these population centers, most of the CVP service area is rural, with irrigated agriculture the predominant land use and economic driver (Reclamation 2007).

SWP water is delivered to contracting agencies in Northern California, the San Francisco Bay Area, the Central Coast, San Joaquin Valley, and Southern California.

Land uses in the CVP/SWP service areas vary and include agricultural, municipal and industrial, commercial, open space, grazing, and timber production.

17.1.2 Planning

Shasta Lake and Vicinity

Federal Land Use Planning Federal lands are not subject to county or city general plans. Land use planning direction for the NRA is guided by Federal legislation (including 36 CFR part 292 subpart B), regional forest directives, and forest-specific management directives found in the STNF Land and Resource Management Plan (LRMP).

The STNF LRMP is based on three broad management strategies: preservation, biodiversity, and sustainable development for people. Resources are categorized by type (e.g., air resources, fisheries, lands) and assigned management goals, standards, and guidelines. The following goals describe the desired future condition of the STNF:

- Lands
 - Plan for long-range land ownership adjustments that support resource objectives.
 - Provide for continued use and new development of hydroelectric facilities.

The six broad categories of land use that apply to the STNF are Congressionally Reserved Areas, LSRs, Administratively Withdrawn Areas, Riparian Reserves, Matrix, and Adaptive Management Areas (USFS 1995). The LRMP requires each type of land use to be managed in accordance with specific standards and guidelines pertaining to each resource type. Lands designated as Riparian Reserve, for example, have specific management standards and guidelines for air quality, biological diversity, fire and fuels, etc. The following describes each type of land use in the STNF:

- **Late Successional Reserves** – LSRs have been established to protect and enhance conditions of late-successional and old-growth forest ecosystems and to ensure the support of related species, including the northern spotted owl. The applicable management prescription is:
 - Provide special management for LSRs and threatened and endangered species. The management prescription includes special,

selected sensitive wildlife species that are primarily dependent on late seral stage conditions.

- **Administratively Withdrawn Areas** – These areas are identified in the LRMP and include recreation and visual areas, backcountry, and other areas where management emphasis precludes scheduled timber harvesting. The applicable management prescriptions are:
 - **Unroaded Non-Motorized Recreation** – Provide for semi-primitive non-motorized recreation opportunities in unroaded areas outside existing wilderness areas while maintaining predominantly natural-appearing areas with only subtle modifications.
 - **Limited Roaded Motorized Recreation** – Provide for semi-primitive motorized recreation opportunities while maintaining predominantly natural-appearing areas with some modifications.
 - **Roaded, High Density Recreation** – Provide areas that are characterized by a substantially modified natural environment.
 - **Special Area Management** – Provide for protection and management of special interest areas and research natural areas.
 - **Heritage Resource Management** – The primary theme of this prescription is to protect designated cultural resource values, interpret significant archaeological and historical values for the public, and encourage scientific research of these selected properties.
- **Riparian Reserves** – Provide an area along streams, wetlands, ponds, lakes, and unstable and potentially unstable areas where riparian-dependent resources receive primary emphasis. The applicable management prescription is:
 - Maintain or enhance riparian areas, wildlife and fisheries habitat, and water quality by emphasizing streamside and wetland management.
- **Matrix** – Includes Federal lands outside the categories of the designated areas listed above. Matrix lands are where most timber harvest would occur and where standards and guidelines are in place to ensure appropriate conservation of ecosystems as well as provide habitat for rare and lesser known species. The applicable management prescriptions are:
 - **Roaded Recreation** – Provide for an area where there are moderate evidences of the sights and sounds of humans.

- **Wildlife Habitat Management** – The primary purpose of this prescription is to maintain and enhance big game, small game, upland game bird, and nongame habitat to provide adequate hunting and viewing opportunities.
- **Adaptive Management Areas** – Manage lands on an ecosystem basis in terms of both technical and social challenges, and in a manner consistent with applicable laws. There are no management prescriptions associated with Adaptive Management Areas.

The LRMP provides another more specific layer of land use planning guidance for the NRA in the Management Guide: Shasta and Trinity Units of the Whiskeytown-Shasta-Trinity NRA (USFS 1996). This document provides the following land use guidance:

- Those private lands that would enhance outdoor recreation opportunities and/or the conservation of scenic, scientific, historic, and other values contributing to the public enjoyment of the NRA should be acquired as opportunities arise.
- Land exchanges will be pursued in accordance with the Forest Land Adjustment Guide. Lands directly adjacent to the shoreline will have the highest priority.
- Lands with significant known pollution sources arising from a history of mining discharge will not be acquired.
- Coordination will take place with Shasta County to allow those private land developments and resource production proposals that will maintain or enhance NRA values, and to disallow or phase out private land uses that detract from those values.
- Coordination will take place with county, State, and other Federal agencies on development, management, and regulatory oversight of recreation opportunities and facilities to ensure consistency with NRA objectives.
- Planning will take place with owners and managers of travel and utility corridors through the NRA (railroad, highway, and major power lines) to minimize the visual impacts of these corridors on the aesthetic value of the NRA.

The STNF coordinates with Shasta County to ensure that private development in the NRA maintains or enhances NRA values through local zoning regulations.

County Land Use Planning Land-use planning on non-Federal land is the province of local governments in California. All cities and counties in California are required by the State to adopt a general plan establishing goals and policies for long-term development, protection from environmental hazards, and conservation of identified natural resources (California Government Code 65300). General plans lay out the pattern of future residential, commercial, industrial, agricultural, open-space, and recreational land uses on non-Federal land within a community. To facilitate implementation of planned growth patterns, general plans identify goals and/or policies to establish land use patterns.

Local governments implement general plans by adopting zoning, subdivision, grading, and other ordinances. Zoning ordinances identify specific types of land uses that may be allowed on a given site and establish specific development standards. Zoning regulations vary from jurisdiction to jurisdiction. However, typical standards promulgated in zoning ordinances include the siting of structures relative to parcel boundaries, architectural design (including height limitations), and the percentage of building coverage allowed relative to the overall square footage of a parcel.

The *Shasta County General Plan* (Shasta County 2004) provides planning guidance for privately owned land in Shasta County. Land use directives are provided in the form of goals, policies, objectives, standards, and guidelines. The following land uses described in the general plan are present in the Shasta Lake and vicinity portion of the primary study area:

- **Rural Residential** – Encompasses areas that receive minimal urban services, usually in or near a rural community center and areas with no urban services that are located in areas of the county characterized by one or more of the following conditions:
 - Severe limitations on septic tank use
 - Uncertain long-term availability of water
 - Proximity to lands categorized as timber, grazing, or crop lands
 - Remoteness from urban, town, and rural community centers
 - Extreme wildland fire hazard
 - Inaccessibility via county-maintained roads
- **Existing Residential** – This designation may be applied to residential areas that existed before 1984 and that do not fit the land use designation or density applied to surrounding properties.

- **Mixed Use** – This category recognizes that in a rural setting the strict segregation of different land use types, which is typically found in urban environments, is neither necessary nor practical. At this scale, conflicts that may result from the intermixing of land uses may be addressed by County zoning and development standards related to screening setbacks and architectural design.
- **Commercial Recreational** – This designation provides opportunities for the development of privately owned lands characterized by the natural environment for the purpose of providing commercial recreation activities that use and provide for the enjoyment of the natural environment. Examples of commercial recreation include campgrounds, fishing and hunting clubs, dude ranches, boating facilities, and recreational vehicle parks. Other uses such as a restaurant or small grocery store may be permitted when accessory to, supportive of, and compatible with the recreation activity.
- **Natural Resources Protection**
 - **Community Parks** – Provides for large-scale community recreation facilities
 - **Habitat** – Provides for protection of significant wildlife habitat resources

Shasta County land use actions and decisions on non-Federal land in the NRA are subject to STNF review and approval pursuant to 36 CFR part 292 subpart B.

Upper Sacramento River (Shasta Dam to Red Bluff)

Land use planning in the upper Sacramento River area consists of general plans adopted by Shasta and Tehama counties and the cities of Shasta Lake, Redding, Anderson, and Red Bluff. BLM lands in this area are managed in accordance with the Redding Resource Management Plan (RMP), discussed in the Regulatory Framework section below.

Local Land Use Planning

Shasta County The *Shasta County General Plan* (2004) designates the following land uses along the Sacramento River from Shasta Dam south to the Tehama County line:

- Rural residential
- Greenway
- Habitat resource
- Natural habitat

- **Agricultural** – cropland
- **Agricultural** – small-scale crops, grazing
- Mineral resources

Tehama County Tehama County is currently updating its general plan. The *Draft Plan and Background Report* were circulated to the public in May 2007. The associated Environmental Impact Report has not been completed. The current *Tehama County General Plan* (1983) designates the following land uses along the Sacramento River from the Shasta County line in the north to Red Bluff:

- Habitat resource, resource lands, and public/wilderness
- Cropland and grazing
- General commercial
- Scenic easement and open space
- Commercial recreation
- Urban and city
- Rural small lot, rural large lot, and suburban

City of Shasta Lake The *City of Shasta Lake General Plan* was adopted in 1999. The general Plan designates the following land uses along Shasta Dam Boulevard, the primary roadway leading up to Shasta Dam:

- Community park
- 100-year floodplain
- Public facilities
- Commercial
- Mixed use
- Rural residential (1 unit/2 acres, 1 unit/5 acres)
- Suburban residential (3 units/acre)
- Urban residential (10 units/acre)
- **Urban residential** – High (20 units/acre)

City of Redding The City of Redding adopted an updated general plan in 2000 (City of Redding 2000). The general plan designates the following land uses along the Sacramento River within the city limits and sphere of influence:

- Greenway
- Park, Park-Golf

- Public Facility; Public Facility-School
- Recreational
- General Office
- General Commercial
- Neighborhood Commercial
- Residential (2–3.5, 3.5–6, 6–10 units/acre)
- Critical Mineral Resource Overlay
- Mixed Use Neighborhood Overlay

City of Anderson The City of Anderson released its updated general plan in May 2007 (City of Anderson 2007). The general plan designates the following land uses along the Sacramento River within the city limits and sphere of influence:

- Commercial
- Industrial
- Public/Quasi-Public
- Medium-Density Residential
- Rural Residential/Rural Estate

City of Red Bluff The City of Red Bluff most recently amended its General Plan Land Use Element in 1993. The general plan designates the following land uses along the Sacramento River within the city limits and sphere of influence:

- Primary Floodplain
- Exclusive Agriculture
- General Commercial
- Central Business Districts
- Single-Family Residential
- General and Neighborhood Apartment Districts
- General Industrial
- Public Agency District
- Park

Lower Sacramento River and Delta

The lower Sacramento River and Delta are within the planning jurisdiction of Butte, Colusa, Contra Costa, Glenn, Sacramento, Solano, Sutter, Yolo, and Yuba counties. The largest cities in this region are Antioch, Chico, Davis, Fairfield, Martinez, Marysville, Pittsburgh, Sacramento, Vacaville, Vallejo, West Sacramento, and Woodland. Each of these entities currently has adopted general plans and zoning ordinances. Land use planning documents are adopted by Federal agencies for Federally managed lands in the lower Sacramento River and Delta areas.

CVP/SWP Service Areas

The CVP extends from the Cascade Range near Redding in the north to the Tehachapi Mountains near Bakersfield in the south. The CVP serves farms, homes, and industry in California's Central Valley as well as major urban centers in the San Francisco Bay Area. SWP contractors are in the southern San Joaquin Valley, Central Coastal area, and Southern California. CVP and SWP service areas include portions of the primary and extended study area. CVP water irrigates more than 3 million acres of farmland and provides drinking water to nearly 2 million consumers. SWP deliveries are 70 percent urban and 30 percent agriculture, serving 20 million Californians and more than 600,000 irrigated acres, respectively. Each of the counties and incorporated cities in the CVP and SWP service areas has adopted general plans and zoning ordinances. Federally managed lands in the service areas are managed in accordance with land use and planning documents similar to the STNF LRMP and the BLM's RMP, and military installations located in the service areas have their own planning processes.

17.2 Regulatory Framework

17.2.1 Federal

Federal land use policies apply only to actions on, or affecting the uses of, Federal lands. Federal lands in the primary study area consist of the following:

- National Forest lands managed by the STNF around Shasta Lake
- Lands along the Sacramento River just south of Shasta Dam managed by Reclamation
- Lands managed by BLM along the Sacramento River south of Shasta Dam as far downstream as Red Bluff

Entry upon or use of these Federally administered lands would require approval from the appropriate Federal entity(ies).

Federal Land Policy and Management Act

The Federal Land Policy and Management Act was enacted to change the Federal public lands policy from disposal to retention. The act directs Federal agencies to apply land use principles that emphasize conservation; these include the principles of multiple use and sustained yield land management policies. The Federal Land Policy and Management Act consolidated and articulated BLM's management responsibilities and applies primarily to this Federal land management agency. Title V of the Federal Land Policy and Management Act also granted the Secretary of the Interior and the Secretary of Agriculture the authority to issue rights-of-way for various uses, including reservoirs.

Code of Federal Regulations

USFS personnel administer their responsibilities for regulating use and protecting National Forest lands under Title 36 of the CFR and sections of titles 16, 18, and 21. Public services directives from the code are integrated into the STNF LRMP and include the following topics: fire and fuels management, facilities management, law enforcement, and land management.

Shasta-Trinity National Forest Land and Resource Management Plan

The STNF LRMP is a forestwide land use plan developed to guide resource management on the STNF. Six broad categories are used to define management strategies. The management strategies (known as land allocations) are implemented through management prescriptions that provide specific standards and guidelines for forest resource management (USFS 1995).

Management Guide for the Shasta and Trinity Units of the Whiskeytown-Shasta-Trinity National Recreation Area

The Management Guide for the NRA contains management strategies intended to achieve or maintain desired conditions for the NRA. The document supplements the STNF LRMP by providing specific information about current conditions in the NRA, desired future conditions for the NRA, and management recommendations for the NRA. The STNF is responsible for administering the Shasta and Trinity units of the NRA.

BLM's Redding Resource Management Plan

BLM's Redding RMP (BLM 1994) provides guidance for the management of cultural resources, fire, grazing, minerals, vegetation, water quality, wildlife and fish habitats, and other resources and issues in Shasta County. The RMP governs land use on BLM lands, including lands in the Sacramento River Management Area. Planning issues addressed in the RMP include land tenure adjustments, such as land acquisition, exchange, and sale; recreation management; access; and forest management, including harvesting, herbicide use, and special-status species.

The RMP was amended by the 1994 Record of Decision for the *Northwest Forest Plan* (Final Supplemental Environmental Impact Statement for Amendments to Forest Service and Bureau of Land Management Planning

Documents within the Range of the Northern Spotted Owl). This amendment required preparation of Watershed Analysis prior to initiating BLM activities. As a party to the *Northwest Forest Plan*, BLM, like USFS, is also required to ensure that projects are consistent with the Aquatic Conservation Strategy.

Federal Wild and Scenic Rivers Act

The Federal WSRA, enacted in 1968, established the National Wild and Scenic Rivers System “to preserve rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations.” To be eligible for inclusion in the system, a river must be free-flowing and exhibit outstandingly remarkable values. Free-flowing means “existing or flowing in a natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway” (16 U.S. Code Sec. 1286). outstandingly remarkable values are scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values (16 USC Sec. 1271). Depending on the specific attributes of a river, it may be designated as “wild,” “scenic,” or “recreation.” Different segments of a single river can receive different designations; in other words, some segments can be designated wild, some scenic, and some recreation or combinations of these designations. Recreation rivers are defined as “rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past” (16 USC Sec. 1286).

State-designated rivers may be added to the Federal system upon the request of the state’s governor and the approval of the Secretary of the Interior (16 USC Sec. 1286). Two sections of the American River were added to the federal system in 1981 under this method. These sections are the lower American River from Nimbus Dam to the river’s confluence with the Sacramento River and the North Fork American River from its source to the Iowa Hill Bridge. The North Fork section is located above Nimbus, Folsom, and Lake Clementine dams many miles upstream from the confluence with Sacramento River. The North Fork is not regulated by Folsom Dam and would not be affected by hydraulic changes in the Sacramento River. The lower American River is designated as a recreational river.

17.2.2 State

California Public Resource Code, Division 6

The California Public Resource Code, Division 6, grants the State Lands Commission (SLC) jurisdiction over 4.5 million acres of land held in trust for Californians. The SLC’s jurisdiction includes a 3-mile-wide section of tidal and submerged land adjacent to the coast and offshore islands, including bays, estuaries, and lagoons. It also includes the waters and beds of more than 120 rivers, lakes, streams, and sloughs. The State holds these lands for the public trust purposes of water-related commerce, navigation, fisheries, recreation, and open space. The SLC may grant dredging permits and issue land use leases for

activities within its jurisdiction. The SLC does not have a comprehensive use plan for these lands but manages them according to State and Federal laws and regulations. In the primary study area, the SLC's jurisdiction includes areas along the Sacramento River north of Red Bluff.

California Fire Plan

The *California Fire Plan* was prepared by the State Board of Forestry and the California Department of Forestry and Fire Protection to provide a comprehensive strategy for wildland fire protection and prevention in California. The plan provides recommendations for fire-safe land use planning. Preventive measures include using fire-resistant building materials, maintaining a defensible space around structures, vegetation management, and infrastructure planning.

Water Quality Control Plan

The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* provides water quality objectives to protect beneficial uses of designated rivers and streams. *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* objectives are incorporated into county and city general plans, zoning ordinances, and subdivision ordinances.

California Public Resources Code, Sections 5093.50–5093.70

The California PRC Sections 5093.50 – 5093.70 were established through 1972 enactment of the Wild and Scenic Rivers Act, which was subsequently amended on several occasions, to preserve certain rivers that possess extraordinary scenic, recreational, fishery, or wildlife values in their free-flowing state. The State PRC identifies, classifies, and provides protection for specific rivers or river segments, as approved by the legislature. Rivers or river segments that are specifically identified and classified in the PRC comprise the State Wild and Scenic Rivers System. As described in PRC Section 5093.50, rivers or river segments included in the State system must possess “extraordinary scenic, recreational, fishery, or wildlife values”; however, the PRC does not define what constitutes “extraordinary.”

Depending on the specific conditions of a river, it may be designated as “wild,” “scenic,” or “recreation.” Different segments of a single river can receive different designations; in other words, some segments can be designated wild, some scenic, and some recreation or combinations of these designations. Recreation river segments are readily accessible by road or railroad, may have some development along their shorelines, and may have been impounded or diverted in the past (PRC Section 5093.53).

With its initial passage, the state system protected segments of eight rivers, including two sections of the American River. These sections include the lower American from Nimbus Dam to its confluence with the Sacramento River and the North Fork from its source to the Iowa Hill Bridge. The North Fork section is located above Nimbus, Folsom, and Lake Clementine dams many miles

upstream from the confluence with Sacramento River. The North Fork is not regulated by Folsom Dam and would not be affected by hydraulic changes in the Sacramento River. The lower American is designated as a recreational river.

17.2.3 Regional and Local

Shasta County General Plan

The *Shasta County General Plan* (2004) guides land use planning on non-Federal land for Shasta County through 2025. The Community Organization and Development Pattern element of the *Shasta County General Plan* establishes policies related to the organization and relationships of the community types present in Shasta County, the living environments these communities offer, and the locations of development in relation to these communities. These policies were developed to maintain and enhance the quality of their environments. The Community Organization and Development Pattern element includes several objectives that influence land use decisions in the project study area:

- To promote a development pattern that will accommodate, consistent with the other objectives of the plan, the growth that will be experienced by Shasta County
- To guide development in a pattern that will provide opportunities for present and future county residents to enjoy the variety of living environments that currently exist within the county
- To guide development in a pattern that will respect the natural resource values of county lands and their contributions to the county's economic base
- To guide development in a pattern that will minimize land use conflicts between adjacent land users
- To recognize that the major economic resources for achieving the development pattern will come from the private sector, rather than government, and that the general plan, as the expression of community values, will guide the use of these resources

Tehama County General Plan

The *Tehama County General Plan* is used to guide future development in unincorporated areas of the county. The county's current general plan was adopted in 1983 and is currently being updated. The updated *Draft General Plan and Background Report* were circulated to the public in May 2007. The Land Use element of the *Draft General Plan* establishes the goals, policies, and implementation measures that will help guide the growth and development of Tehama County for the next 20 years. This element also contains the General Plan Land Use Diagram, which delineates those areas of the county where

future residential development of varying densities and nonresidential growth is anticipated or will be directed (Tehama County 2007a and 2007b).

City of Shasta Lake General Plan

The planning boundaries for the *City of Shasta Lake General Plan* are within the Shasta Lake and vicinity study area, north of Keswick Dam, east of the Sacramento River, and west of I-5. This general plan was adopted in 1999 and is intended to guide land use planning within the city through the Year 2020 (City of Shasta Lake 1999). The following statement from the Land Use element of the general plan identifies some of the concerns surrounding land use decisions within the City of Shasta Lake:

The Land Use Element and the Land Use and Circulation Map constitute the physical framework for the general plan, which designates the proposed location, distribution, and extent of land uses. Land use was a specific area of concern identified as being key to the development of the City of Shasta Lake. Some of the major issues identified included an evaluation and establishment of urban, rural, and urban reserve boundaries. This was accomplished by identifying areas that currently lack infrastructure that would be required to develop in an orderly manner through the development of Area Plans.

City of Redding General Plan

The planning boundaries for the *City of Redding General Plan* encompass areas within the city limits and the urban growth boundary. This plan was adopted in 2000 and is intended to guide land use planning through the year 2020 (City of Redding 2000). The Community Development and Design element of the general plan states the following about the role and effects of land use policies:

Land use policies and the General Plan Diagram affect every property in the City. They determine how people can use/develop their land and what they can reasonably expect to develop next door, down the street, or across town. They provide for overall consistency and compatibility between land uses and can be a determining factor in quality of life. The policies ... also have a direct bearing on traffic, the feasibility of public transportation, and the quality of the air.

City of Anderson General Plan

The planning boundaries of the *City of Anderson General Plan* encompass areas within the city limits and the urban growth boundary. The City of Anderson released its updated general plan in May 2007 (City of Anderson 2007). The general plan is intended to guide land use planning within the city through the Year 2027. The following statement from the Land Use element of the general plan identifies some of the concerns surrounding land use decisions within the City of Anderson:

The Land Use Element describes the pattern of land development within the City of Anderson and the proposed expansion area and provides direction for the future development envisioned for the City. Also included in this Element are descriptions of geographic areas that are anticipated to be developed over the term of this General Plan and goals and policies to guide the City's decision makers in their review of development proposals. This Element also defines land use categories and provides supporting detail for the uses depicted upon the Anderson General Plan Land Use Diagram.

Red Bluff General Plan

The planning boundaries for the *City of Red Bluff General Plan* encompass areas within the city limits and the urban growth boundary. The adopted General Plan elements are as follows: Circulation element (1991), Housing element (2004), and Land Use, Natural Environment, Noise, and Safety Elements (1993). The following statement from the Land Use element summarizes concerns relative to land use decisions in Red Bluff (City of Red Bluff 1993):

The land use element identifies the spatial arrangement of existing and proposed uses of land including public lands and facilities. It lays out the distribution of classes of land use, the intensity of those uses, and proposes a strategy of goals, objectives, policies and implementation measures to promote a wise use of land to promote the welfare of the community.

17.3 Environmental Consequences and Mitigation Measures

17.3.1 Methods and Assumptions

To characterize existing land uses in the primary study area, pertinent planning documents were reviewed to identify objectives for the level, type, location, density, and intensity of development and to determine whether the alternatives would be in conflict with current plans and policies. Planning documents that were reviewed include the STNF LRMP (USFS 1995), the Management Guide for the NRA, and the general plans for the cities of Shasta Lake, Redding, Anderson, and Red Bluff and Shasta and Tehama counties. Land use maps and zoning maps were consulted to identify planned land uses. The analysis also included a review of aerial photography to determine existing land uses in the primary study area.

The impacts of each alternative are analyzed separately, starting with the analysis of the No-Action Alternative, followed by each of the action alternatives. The impact analysis includes a discussion of both direct and indirect impacts associated with each alternative.

17.3.2 Criteria for Determining Significance of Effects

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by, or result from, the proposed action. Under NEPA, the significance of an effect is used solely to determine whether an EIS must be prepared. An environmental document prepared to comply with CEQA must identify the potentially significant environmental effects of a proposed project. A “[s]ignificant effect on the environment” means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project” (CEQA Guidelines, Section 15382). CEQA also requires that the environmental document propose feasible measures to avoid or substantially reduce significant environmental effects (CEQA Guidelines, Section 15126.4(a)).

The following significance criteria were developed based on guidance provided by the State CEQA Guidelines and consider the context and intensity of the environmental effects as required under NEPA. An alternative was determined to result in a significant effect related to land use and planning if it would do any of the following:

- Create land uses that are incompatible with existing and planned land uses adjacent to actions described as part of the project
- Introduce substantial nuisance effects on sensitive land uses that would disrupt use over an extended time period
- Conflict with any applicable land use plan, policy, ordinance, or regulation of an agency with jurisdiction over the project (including general plans, specific plans, and zoning ordinances) adopted for the purpose of avoiding or mitigating an environmental effect
- Disrupt or divide the physical arrangement of an established community
- Conflict with any applicable habitat conservation or natural community conservation plan

17.3.3 Topics Eliminated from Further Consideration

Effects of the proposed enlargement of Shasta Lake on the listed segments of the American River have been eliminated from further consideration in this EIS. The listed segment of the North Fork American River has been eliminated because it is above any regulated reaches and is many miles from the confluence of the American and Sacramento rivers. The lower American River has been eliminated because none of the alternatives would adversely affect its designation as a recreational river under the Federal WSRA or State PRC. Under each of the action alternatives, releases from Shasta Dam would increase from late spring through early autumn. Increased releases from Shasta Dam during this period would reduce the volume of water released from Folsom Dam

during the primary recreation season on the lower American River (late spring through early autumn). Flow volumes and water levels within the lower American River would, however, remain substantially similar to existing conditions and would remain within the river's typical range of variation during the primary recreation season. During the secondary recreation season (autumn through spring), precipitation is greater, flows in the Sacramento River and Delta are higher, and releases from Shasta Dam would be reduced to increase storage in Shasta Lake. Reclamation may need to occasionally increase releases from Folsom Dam to accommodate demand and offset decreased releases from Shasta Dam. Flow volumes and water levels in the lower American River would, however, remain substantially similar to existing conditions and within the river's typical range of variation during the secondary recreation season.

17.3.4 Direct and Indirect Effects

No-Action Alternative

Shasta Lake and Vicinity, Upper Sacramento River (Shasta Dam to Red Bluff), Lower Sacramento River and Delta, and CVP/SWP Service Areas
The impact discussion for the No-Action Alternative addresses all three study areas together, because this alternative would not impact land use in either of the three study areas.

Impact LU-1 (No-Action): Disrupt Existing Land Uses No new facilities would be constructed and no existing facilities would be altered, expanded, or demolished. Therefore, there would be no impact. Mitigation is not required for the No-Action Alternative.

Impact LU-2 (No-Action): Conflict with Existing Land Use Goals and Policies of Affected Jurisdictions No new facilities would be constructed and no existing facilities would be altered, expanded, or demolished. Therefore, there would be no impact. Mitigation is not required for the No-Action Alternative.

CP1 – 6.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff) The impact discussion for CP1 addresses the Shasta Lake and Vicinity and Upper Sacramento River study areas together, because impacts from construction activities would affect both study areas.

Impact LU-1 (CP1): Disrupt Existing Land Uses Project construction activities associated with enlarging Shasta Dam and relocating utilities, infrastructure, and public service and recreational facilities could result in short-term and long-term disruptions to land uses by interfering with the ability to use certain lands and interfering with access to certain lands. Construction activities that could disrupt land uses include the transport of project materials to and from project construction sites and the demolition and relocation of some utilities. This impact would be potentially significant.

It is anticipated that construction activities would be limited to the Shasta Lake and vicinity study area; therefore, no impacts associated with disruption of existing land uses would be expected to occur downstream from Shasta Dam.

Construction activities specific to enlarging Shasta Dam would be limited to the existing footprint of the Shasta Dam facilities and areas immediately adjacent. The project construction site would be accessed by existing roadways (I-5, Shasta Dam Boulevard, and Lake Boulevard). The access roads allow commercial truck use and are capable of supporting project-generated traffic. Road modifications would be necessary to accommodate project traffic en route to the construction sites and access restrictions would occur. Noise, air quality, and traffic impacts along these local roadways are evaluated in separate sections of the PDEIS. Equipment staging areas would be sited to avoid affecting or conflicting with existing land uses.

Project construction activities associated with relocating utilities, infrastructure, and public service and recreational facilities could result in temporary and localized disruptions of existing land uses. Lake inundation resulting from future dam operations could result in long-term disruptions of land uses in the primary study area. The Utilities and Miscellaneous Minor Infrastructure Technical Memorandum provides descriptions and detailed maps of the utilities and minor infrastructure that would be demolished or relocated in the ancillary areas near Shasta Lake (Reclamation 2007). Chapter 21 (Utilities and Service Systems) of this PDEIS evaluates the project's impacts on utilities and service systems, and the environmental impacts of utilities demolition and relocation are evaluated in the pertinent technical chapters of the EIS (e.g., Water Quality, Air Quality and Climate, and Noise and Vibration).

Construction activities would affect major features around Shasta Lake and vicinity and would require demolition, relocation, modification, or reconstruction to prevent inundation of the features caused by an increased reservoir elevation. The major features affected would include:

- Major roads and road segments (Lakeshore Drive realignment)
- Vehicle bridges (Charlie Creek, Doney Creek, McCloud River, Didallas Creek, and Second Creek)
- Railroad bridge
- Utilities and service systems infrastructure
- Campgrounds and picnic areas
- Buildings (resort/marina, residential, USFS facilities)

The communities of Lakeshore and Sugarloaf would be affected the most by transportation infrastructure relocation activities. Seventy-five small road segments (both paved and unpaved) would need to be modified. CP1 would result in the inundation of Lakeshore Drive at numerous locations south of Charlie Creek Bridge and in two locations between Charlie Creek and Doney Creek bridges. Relocation of Lakeshore Drive and the UPRR would occur near existing residences and businesses. Road construction activity could result in temporary and localized increases in dust, noise, and construction truck traffic and potential disruption of access.

Seven bridges would need to be replaced. Construction activities associated with bridge modifications and relocations, particularly in areas with existing development such as Bridge Bay Marina and the communities of Lakeshore and Sugarloaf, could result in short-term disruptions of nearby residential, commercial, and industrial land uses. Bridge construction activity could result in temporary and localized increases in dust, noise, and construction truck traffic and potential disruption of access.

Approximately 66,000 feet of power and telecommunications lines would need to be demolished and reconstructed in areas around Shasta Lake. Utilities infrastructure relocation activities could result in short-term disruptions of land uses in communities and recreation areas around Shasta Lake. Relocation activities could require partial or full road closures and other access restrictions to ensure public safety. Utilities relocation activities could also result in temporary and localized increases in dust, noise, heavy equipment traffic, and other project traffic.

An estimated 45 buildings would be affected under a 6.5-foot dam raise. The buildings have been categorized as residential (cottages, homes, etc.), commercial (resorts, marinas, stores, etc.), and USFS sites (work stations, campground buildings, recreation site restrooms, etc.). Buildings within the inundation area would be removed, and some would be relocated. Utilities associated with the removed buildings (water systems, septic systems, telecommunications and power facilities) would also require demolition or abandonment. Construction activity related to removal and/or relocation of buildings would result in temporary and localized increases in dust, noise, and construction truck traffic and potential disruption of access. Some existing marinas would need to be modified or relocated, which would disrupt existing commercial and recreational land uses. See the *Recreation and Public Access Technical Report* for details concerning marina relocations.

Reservoir dikes would be required in the areas of Antlers/Lakeshore and at the UPRR track at the south end of Bridge Bay for protection of existing infrastructure from increased full pool elevations. Additional sites for dike construction could be added in the future. Dike construction could serve to lessen long-term land use impacts resulting from the project by eliminating the need to remove and relocate a number of structures. Construction activities

associated with dike construction would result in temporary and localized increases in dust, noise, and construction truck traffic and potential disruption of access.

Project implementation could result in short-term disruptions of land uses of parcels around Shasta Lake and vicinity during construction and relocation activities; long-term disruptions of land use could also result from project operations. This impact would be potentially significant. Mitigation for this impact is proposed in Section 17.3.5.

Impact LU-2 (CP1): Conflict with Existing Land Use Goals and Policies of Affected Jurisdictions Project implementation would result in inundating land around Shasta Lake, which could conflict with land use goals and policies of affected jurisdictions. Relocation of utilities and service systems resulting from project implementation could also conflict with existing land use goals and policies. This impact would be potentially significant.

It is anticipated that construction activities would be limited to the Shasta Lake and vicinity study area; therefore, no conflicts with existing land use goals and policies would be expected to occur in planning jurisdictions downstream from Shasta Dam.

Project implementation would result in an increase in reservoir pool elevation during extreme storm events, which could result in the flooding of approximately 1,200 acres in the lower elevations around Shasta Lake. To prevent utilities and infrastructure damage, Reclamation would relocate roads, utilities and service systems, marinas, and other structures and would modify a number of bridges. Relocation plans are based on broad assumptions regarding optimum construction, operation, and environmental conditions. Areas planned for relocation activities could have land use designations that conflict with the land use proposed by the project. It is anticipated that some relocation activities would conflict with land use designations. Specific relocation sites are needed before a detailed analysis can be made. Once relocation sites are known, the proposed land use would be compared to the existing land uses and land use designations to determine consistency with the USFS LRMP and the *Shasta County General Plan* and the Shasta County Zoning Ordinance.

Areas that would be most affected by project implementation are located on the Sacramento Arm of Shasta Lake and include the communities of Sugarloaf and Lakeshore. A number of existing residential land uses would be inundated by a higher full pool elevation in Shasta Lake. Residences within 20 feet of the new full pool elevation will be demolished and most will be relocated.

Most recreation facilities that could be inundated by project implementation would be relocated; some recreation facilities would be relocated adjacent to existing recreation facilities. Sites proposed for the relocation of recreational facilities could be inconsistent with the current land use designations.

Reclamation would cooperate with USFS to find the most suitable relocation sites that would be consistent with the STNF LRMP and the NRA Management Guide.

Open space lands would be inundated. STNF LRMP land allocations that would be inundated include Riparian Reserve allocations. Loss of the use of NRA lands would be inconsistent with LRMP and NRA goals and policies. Reclamation would coordinate mitigation measures with USFS to minimize the impacts from losing the ability to use lands around Shasta Lake.

Vegetation clearing required for the relocation of structures, marinas, recreation facilities, and utilities could be inconsistent with the STNF LRMP, the *Shasta County General Plan*, and the Shasta County Zoning Ordinance. Many relocation activities would require vegetation clearing prior to construction. Specific clearing sites would be dependent on the sites chosen for utilities, building, and infrastructure relocation. The sites have not been determined at this time. Once specific relocation sites are known and the areas requiring vegetation clearance are determined, an analysis would be performed to determine whether the proposed action would be inconsistent with the STNF LRMP, the NRA Management Guide, the *Shasta County General Plan*, and the Shasta County Zoning Ordinance. Reclamation would obtain authorization and/or use permits from USFS for actions within the jurisdiction of USFS; Reclamation would also obtain authorization and/or use permits from Shasta County and the California Department of Forestry and Fire Protection for vegetation clearing activities within the jurisdiction of Shasta County.

It should be noted that even where site-specific land use designations in the NRA conflict with proposed relocation activities, the STNF LRMP identifies the following overarching goal for the STNF: “provide for continued use and new development of hydroelectric facilities.” This implies that specific USFS land allocations that may be inconsistent with relocation activities could be revised or amended for project purposes. However, Reclamation would cooperate with USFS to amend site-specific land use designations, which could require additional NEPA review.

Site-specific information is needed for all infrastructure, building, and utilities relocation plans to review completely for consistency with existing land use planning documents, primarily the STNF LRMP and the *Shasta County General Plan*. Given the magnitude of facilities that might be relocated, including existing marinas, it is anticipated that there would be some inconsistencies with existing planning policies. This impact would be potentially significant. Mitigation for this impact is proposed in Section 17.3.5.

Lower Sacramento River and Delta and CVP/SWP Service Areas

Impact LU-3 (CPI): Disrupt Existing Land Uses Construction activities would be limited to the primary study area; therefore, there would be no disruption of

existing land uses in the extended study area. There would be no impact. Mitigation for this impact is not needed, and thus not proposed.

Impact LU-4 (CP1): Conflict with Existing Land Use Goals and Policies of Affected Jurisdictions Construction activities would be limited to the primary study area; therefore, no conflicts with existing land use goals and policies would occur in the extended study area. There would be no impact. Mitigation for this impact is not needed, and thus not proposed.

CP2 – 12.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff) The impact discussion for CP2 addresses the Shasta Lake and Vicinity and Upper Sacramento River study areas together, because impacts from construction activities would affect both study areas.

Impact LU-1 (CP2): Disrupt Existing Land Uses Project construction activities associated with enlarging the Shasta Dam facilities and relocating utilities and infrastructure could result in short-term and long-term disruptions to land uses by interfering with the ability to use certain lands and interfering with access to land. Construction activities that could disrupt land uses include the transport of project materials to and from project construction sites. This impact would be potentially significant.

This impact would be similar to Impact LU-1 (CP1). A dam raise of 12.5 feet would result in a larger area of inundation than CP1, which would, in turn, result in additional relocation of existing structures, infrastructure, and utilities and a longer duration for the impact. Reclamation estimates the construction of CP2 would take 44 months, which would be 8 months longer than for CP1. CP2 would, therefore, result in longer term disruptions of land use than would CP1. Approximately 500 additional acres would be inundated by CP2, totaling 1,734 acres of land that would be inundated by Shasta Dam operations. Specific information regarding the location and number of structures that would permanently lost will be incorporated into the land use impact analysis.

Project implementation could result in short-term and long-term disruptions of existing land uses. Therefore, this impact would be potentially significant. Mitigation for this impact is proposed in Section 17.3.5.

Impact LU-2 (CP2): Conflict with Existing Land Use Goals and Policies of Affected Jurisdictions Project implementation could result in a permanent loss of inundated land around Shasta Lake, which could conflict with land use goals and policies of affected jurisdictions. Relocation of utilities and service systems resulting from project implementation could also conflict with existing land use goals and policies. This impact would be potentially significant.

This impact would be similar to LU-2 (CP1). A dam raise of 12.5 feet would create a larger area of inundation than CP1, which, compared to CP1, would result in additional relocation of structures and infrastructure that would be subject to USFS and Shasta County land use goals and policies. A site-specific analysis would be conducted to determine where relocation activities and permanent land base losses resulting from project implementation would be inconsistent with the STNF LRMP, the NRA Management Guide, the *Shasta County General Plan*, and the Shasta County Zoning Ordinance.

Project implementation could result in short-term and long-term impacts that could conflict with existing land use goals and policies. Therefore, this impact would be potentially significant. Mitigation for this impact is proposed in Section 17.3.5.

Lower Sacramento River and Delta and CVP/SWP Service Areas

Impact LU-3 (CP2): Disrupt Existing Land Uses Construction activities would be limited to the primary study area; therefore, there would be no disruption of existing land uses in the extended study area. There would be no impact. Mitigation for this impact is not needed, and thus not proposed.

Impact LU-4 (CP2): Conflict with Existing Land Use Goals and Policies of Affected Jurisdictions Construction activities would be limited to the primary study area; therefore, no conflicts with existing land use goals and policies would occur in the extended study area. There would be no impact. Mitigation for this impact is not needed, and thus not proposed.

CP3 – 18.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff) The impact discussion for CP3 addresses the Shasta Lake and Vicinity and Upper Sacramento River study areas together, because impacts from construction activities would affect both study areas.

Impact LU-1 (CP3): Disrupt Existing Land Uses Project construction activities associated with enlarging the Shasta Dam facilities and relocating utilities and infrastructure could result in short- and long-term disruptions to land uses by interfering with the ability to use certain lands and interfering with access to land. Construction activities that could disrupt land uses include the transport of project materials to and from project construction sites. This impact would be potentially significant.

This impact would be similar to LU-1 (CP1). A dam raise of 18.5 feet would result in a larger area of inundation than CP1, which would result in additional relocation of existing structures and infrastructure compared to CP1 and a longer duration for the impact. Reclamation estimates that construction of CP3 would take 46 months, which would be 10 months longer than for CP1. Approximately 2,500 acres of land would be inundated by CP3 and, according to the 2003 infrastructure inventory at Shasta Lake, an estimated 130 buildings

would be inundated under an 18.5-foot dam raise (Shasta County 2003). Specific information regarding the location and number of structures that would be permanently lost would be incorporated into the land use impact analysis. CP3 would require a more extensive (longer and wider) system of reservoir dikes than CP1 to accommodate increased Shasta Lake elevations resulting from Shasta Dam operations. A dam raise of 18.5 feet would result in the encroachment of 100 road segments. Lakeshore Drive could be inundated for nearly its entire length between Charlie Creek and Doney Creek.

Project implementation could result in short- and long-term disruptions of existing land uses. Therefore, this impact would be potentially significant. Mitigation for this impact is proposed in Section 17.3.5.

Impact LU-2 (CP3): Conflict with Existing Land Use Goals and Policies of Affected Jurisdictions Project implementation could result in a permanent loss of inundated land around Shasta Lake, which could conflict with land use goals and policies of affected jurisdictions. Relocation of utilities and service systems resulting from project implementation could also conflict with existing land use goals and policies. This impact would be potentially significant.

This impact would be similar to LU-2 (CP1). A dam raise of 18.5 feet would result in a larger area of inundation than CP1, which, compared to CP1, would result in additional relocation of existing structures and infrastructure that would be subject to existing USFS and Shasta County land use goals and policies. A site-specific analysis would be conducted to determine where relocation activities and permanent land base losses resulting from project implementation would be inconsistent with the STNF LRMP, the NRA Management Guide, the *Shasta County General Plan*, and the Shasta County Zoning Ordinance.

Project implementation could result in short-term and long-term impacts that could conflict with existing land use goals and policies. Therefore, this impact would be potentially significant. Mitigation for this impact is proposed in Section 17.3.5.

Lower Sacramento River and Delta and CVP/SWP Service Areas

Impact LU-3 (CP3): Disrupt Existing Land Uses Construction activities would be limited to the primary study area; therefore, there would be no disruption of existing land uses in the extended study area. There would be no impact. Mitigation for this impact is not needed, and thus not proposed.

Impact LU-4 (CP3): Conflict with Existing Land Use Goals and Policies of Affected Jurisdictions Construction activities would be limited to the primary study area; therefore, no conflicts with existing land use goals and policies would occur in the extended study area. There would be no impact. Mitigation for this impact is not needed, and thus not proposed.

CP4 – 18.5-Foot Dam Raise, Anadromous Fish Focus with Water Supply Reliability

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff) The impact discussion for CP4 addresses the Shasta Lake and Vicinity and Upper Sacramento River study areas together, because impacts from construction activities would affect both study areas.

Impact LU-1 (CP4): Disrupt Existing Land Uses Project construction activities associated with enlarging the Shasta Dam facilities and relocating utilities and infrastructure could result in short-term and long-term disruptions to land uses by interfering with the ability to use certain lands and interfering with access to land. Construction activities that could disrupt land uses include the transport of project materials to and from project construction sites. This impact would be potentially significant.

This impact would be similar to LU-1 (CP1). Therefore, this impact would be potentially significant. Mitigation for this impact is proposed in Section 17.3.5.

Impact LU-2 (CP4): Conflict with Existing Land Use Goals and Policies of Affected Jurisdictions Project implementation could result in a permanent loss of inundated land around Shasta Lake, which could conflict with land use goals and policies of affected jurisdictions. Relocation of utilities and service systems resulting from project implementation could also conflict with existing land use goals and policies. This impact would be potentially significant.

This impact would be similar to LU-2 (CP1). Therefore, this impact would be potentially significant. Mitigation for this impact is proposed in Section 17.3.5.

Lower Sacramento River and Delta and CVP/SWP Service Areas

Impact LU-3 (CP4): Disrupt Existing Land Uses Construction activities would be limited to the primary study area. Gravel augmentation and the Reading Island habitat restoration along the upper Sacramento River could cause minor disruptions of existing land uses in the extended study area. This impact would be less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact LU-4 (CP4): Conflict with Existing Land Use Goals and Policies of Affected Jurisdictions Construction activities would be limited to the primary study area. Gravel augmentation and the Reading Island habitat restoration along the upper Sacramento River would not alter land uses and would not be expected to conflict with existing land use goals and policies. This impact would be less than significant. Mitigation for this impact is not needed, and thus not proposed.

CP5 – 18.5-Foot Dam Raise, Combination Plan

Shasta Lake and Vicinity and Upper Sacramento River (Shasta Dam to Red Bluff) The impact discussion for CP5 addresses the Shasta Lake and

Vicinity and Upper Sacramento River study areas together, because impacts from construction activities would affect both study areas.

Impact LU-1 (CP5): Disrupt Existing Land Uses Project construction activities associated with enlarging the Shasta Dam facilities and relocating utilities and infrastructure could result in short-term and long-term disruptions to land uses by interfering with the ability to use certain lands and interfering with access to land. Construction activities that could disrupt land uses include the transport of project materials to and from project construction sites. This impact would be potentially significant.

This impact would be similar to LU-1 (CP1). Therefore, this impact would be potentially significant. Mitigation for this impact is proposed in Section 17.3.5.

Impact LU-2 (CP5): Conflict with Existing Land Use Goals and Policies of Affected Jurisdictions Project implementation could result in a permanent loss of inundated land around Shasta Lake, which could conflict with land use goals and policies of affected jurisdictions. Relocation of utilities and service systems resulting from project implementation could also conflict with existing land use goals and policies. This impact would be potentially significant.

This impact would be similar to LU-2 (CP-1). Therefore, this impact would be potentially significant. Mitigation for this impact is proposed in Section 17.3.5.

Lower Sacramento River and Delta and CVP/SWP Service Areas

Impact LU-3 (CP5): Disrupt Existing Land Uses Construction activities would be limited to the primary study area. Gravel augmentation and the Reading Island habitat restoration along the upper Sacramento River could cause minor disruptions of existing land uses in the extended study area. This impact would be less than significant. Mitigation for this impact is not needed, and thus not proposed.

Impact LU-4 (CP5): Conflict with Existing Land Use Goals and Policies of Affected Jurisdictions Construction activities would be limited to the primary study area. Gravel augmentation and the Reading Island habitat restoration along the upper Sacramento River would not alter land uses and would not be expected to conflict with existing land use goals and policies. This impact would be less than significant. Mitigation for this impact is not needed, and thus not proposed.

17.3.5 Mitigation Measures

Table 17-1 presents a summary of mitigation measures for land use.

Table 17-1. Summary of Mitigation Measures for Land Use

Impact		No-Action Alternative	CP1	CP2	CP3	CP4	CP5
Impact LU-1: Disrupt Existing Land Uses (Shasta Lake and Vicinity and Upper Sacramento River)	LOS before Mitigation	NI	PS	PS	PS	PS	PS
	Mitigation Measure	None required.	LU-1: Minimize and/or Avoid Temporary Disruptions to Local Communities.				
	LOS after Mitigation	NI	SU	SU	SU	SU	SU
Impact LU-2: Conflict with Existing Land Use Goals and Policies of Affected Jurisdictions (Shasta Lake and Vicinity and Upper Sacramento River)	LOS before Mitigation	NI	PS	PS	PS	PS	PS
	Mitigation Measure	None required.	LU-2: Minimize and/or Avoid Conflicts with Land Use Goals and Policies.				
	LOS after Mitigation	NI	SU	SU	SU	SU	SU
Impact LU-3: Disrupt Existing Land Uses (Lower Sacramento River, Delta, CVP/SWP Service Areas)	LOS before Mitigation	NI	NI	NI	NI	LTS	LTS
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NI	NI	NI	NI	LTS	LTS
Impact LU-4: Conflict with Existing Land Use Goals and Policies of Affected Jurisdictions (Lower Sacramento River, Delta, CVP/SWP Service Areas)	LOS before Mitigation	NI	NI	NI	NI	LTS	LTS
	Mitigation Measure	None required.	None needed; thus, none proposed.				
	LOS after Mitigation	NI	NI	NI	NI	LTS	LTS

Notes:

LOS = level of significance

LTS = less than significant

NI = no impact

PS = potentially significant

SU = significant and unavoidable

No-Action Alternative

No mitigation measures are required for this alternative.

CP1 – 6.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

No mitigation is required for Impacts LU-3 and LU-4 for the extended study area. Mitigation is provided below for Impacts of CP1 on land uses in the primary study area.

Mitigation Measure LU-1 (CP1): Minimize and/or Avoid Temporary Disruptions to Local Communities

To minimize and/or avoid temporary

disruption to local communities, the following measures will be implemented during project construction:

- Prior to construction, Reclamation and its contractor will develop a construction plan for each affected community (i.e., Lakeshore, Sugarloaf), consisting of the following:
 - Alternate access routes will be identified for local residences and businesses affected by project construction activities.
 - Construction and staging areas will be fenced, secured, and clearly marked. Security will be provided to ensure public safety.
 - Public parking areas outside of the construction staging areas will be kept clear of construction-related equipment or materials at all times.
 - Any open trenches will be covered or secured after daily activities to protect worker and public safety.
 - Construction activities near noise-sensitive land uses (e.g., near residences, campgrounds) or land uses that experience high levels of public activity (e.g., boat ramps, marinas) will be restricted to days and hours that minimize land use conflicts to the extent feasible.
- The contractor will provide advance notice of the construction activities schedule to the affected community members (e.g., residences, property owners, business owners, and public facilities operators), including posting of signs in the project area.
- The contractor will provide a phone number and community contact for inquiries about the project throughout the construction period.
- Reclamation and its contractor will coordinate with local jurisdictions and obtain all necessary permits (e.g., encroachment permit, utility excavation permit), will comply with permit conditions established to minimize construction impacts, and will assign an inspector to the project to oversee construction activities.

Implementing this mitigation measure would substantially reduce land use capability impacts generated by short-term construction activities, but might not reduce all impacts to a less than significant level. As a result, this impact would remain significant and unavoidable.

Mitigation Measure LU-2 (CP1): Minimize and/or Avoid Conflicts with Land Use Goals and Policies To reduce conflicts with land use goals and

policies of affected jurisdictions, Reclamation will implement the following measures:

- Reclamation will coordinate with USFS to find the most suitable relocation sites for recreation facilities with respect to consistency with the STNF LRMP and the NRA Management Guide.
- Reclamation will coordinate with USFS to identify measures to minimize the impacts of the loss of use of USFS lands around Shasta Lake (including open space and Riparian Reserve allocations) caused by inundation, and measures to offset inconsistencies with the LRMP and NRA goals and policies related to the loss of use of NRA lands.
- As utility and facility relocation sites are being refined, Reclamation will evaluate consistency of the relocated land uses with the USFS LRMP, the NRA Management Guide, the Shasta County General Plan, and the county zoning ordinance. To the degree possible, Reclamation will design the relocated utilities and facilities to comply with these plans and ordinances. If needed, Reclamation would seek permits, easements, and or plan amendments.

Implementing this mitigation measure would substantially reduce land use plan consistency impacts, but might not reduce all impacts to a less than significant level. As a result, this impact would remain significant and unavoidable.

CP2 – 12.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply Reliability

No mitigation is required for Impacts LU-3 and LU-4 for the extended study area. Mitigation is provided below for the impacts of CP2 on land uses in the primary study area.

Mitigation Measure LU-1 (CP2): Minimize and/or Avoid Temporary Disruptions to Local Communities This mitigation measure is identical to Mitigation Measure LU-1 (CP1).

Mitigation Measure LU-2 (CP2): Minimize and/or Avoid Conflicts with Land Use Goals and Policies This mitigation measure is identical to Mitigation Measure LU-2 (CP1).

CP3 – 18.5-Foot Dam Raise, Anadromous Fish Survival and Water Supply

No mitigation is required for impacts LU-3 and LU-4. Mitigation is provided below for the impacts of CP3 on land uses in the primary study area.

Mitigation Measure LU-1 (CP3): Minimize and/or Avoid Temporary Disruptions to Local Communities This mitigation measure is identical to Mitigation Measure LU-1 (CP1).

Mitigation Measure LU-2 (CP3): Minimize and/or Avoid Conflicts with Land Use Goals and Policies This mitigation measure is identical to Mitigation Measure LU-2 (CP1).

CP4 – 18.5-Foot Dam Raise, Anadromous Fish Focus with Water Supply Reliability

No mitigation is required for impacts LU-3 and LU-4 in the extended study area. Mitigation is provided below for the impacts of CP4 on land uses in the primary study area.

Mitigation Measure LU-1 (CP4): Minimize and/or Avoid Temporary Disruptions to Local Communities This mitigation measure is identical to Mitigation Measure LU-1 (CP1).

Mitigation Measure LU-2 (CP4): Minimize and/or Avoid Conflicts with Land Use Goals and Policies This mitigation measure is identical to Mitigation Measure LU-2 (CP1).

CP5 – 18.5-Foot Dam Raise, Combination Plan

No mitigation is required for impacts LU-3 and LU-4 for the extended study area. Mitigation is provided below for the impacts of CP5 on land uses in the primary study area.

Mitigation Measure LU-1 (CP5): Minimize and/or Avoid Temporary Disruptions to Local Communities This mitigation measure is identical to Mitigation Measure LU-1 (CP1).

Mitigation Measure LU-2 (CP5): Minimize and/or Avoid Conflicts with Land Use Goals and Policies This mitigation measure is identical to Mitigation Measure LU-2 (CP1).

17.3.6 Cumulative Effects

The action alternatives could temporarily affect land use in the Shasta Lake and vicinity portion of the project area during construction, and some components might be inconsistent with the USFS LRMP, the NRA Management Guide, the Shasta County General Plan, and the county zoning ordinance. Only a few of the present or reasonably foreseeable future actions are located in the vicinity of Shasta Lake and have the potential to conflict with land uses that might also be affected by construction of the action alternatives. These actions include Antlers Bridge replacement, the Turntable Bay Master Development Plan, and the Iron Mountain Mine Restoration Plan. The Antlers Bridge replacement is currently under construction and would be completed before any of the action alternatives would begin. With respect to the Turntable Bay Master Development Plan and the Iron Mountain Mine Restoration Plan, it is unlikely these activities would occur simultaneously with the action alternatives, or would considerably and adversely affect use of the same land. Therefore, construction activities related to implementation of the proposed SLWRI alternatives would not contribute

considerably to significant cumulative impacts related to temporary land use impacts.

A few of the present or reasonably foreseeable future actions are located in the STNF, the NRA, or Shasta County. As with the action alternatives, some of these actions might not be consistent with the USFS LRMP, the NRA Management Guide, the Shasta County General Plan, and the county zoning ordinance. The cumulative effects of these actions on resources protected by these land use plans are addressed in other the pertinent technical chapters of the PDEIS.

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